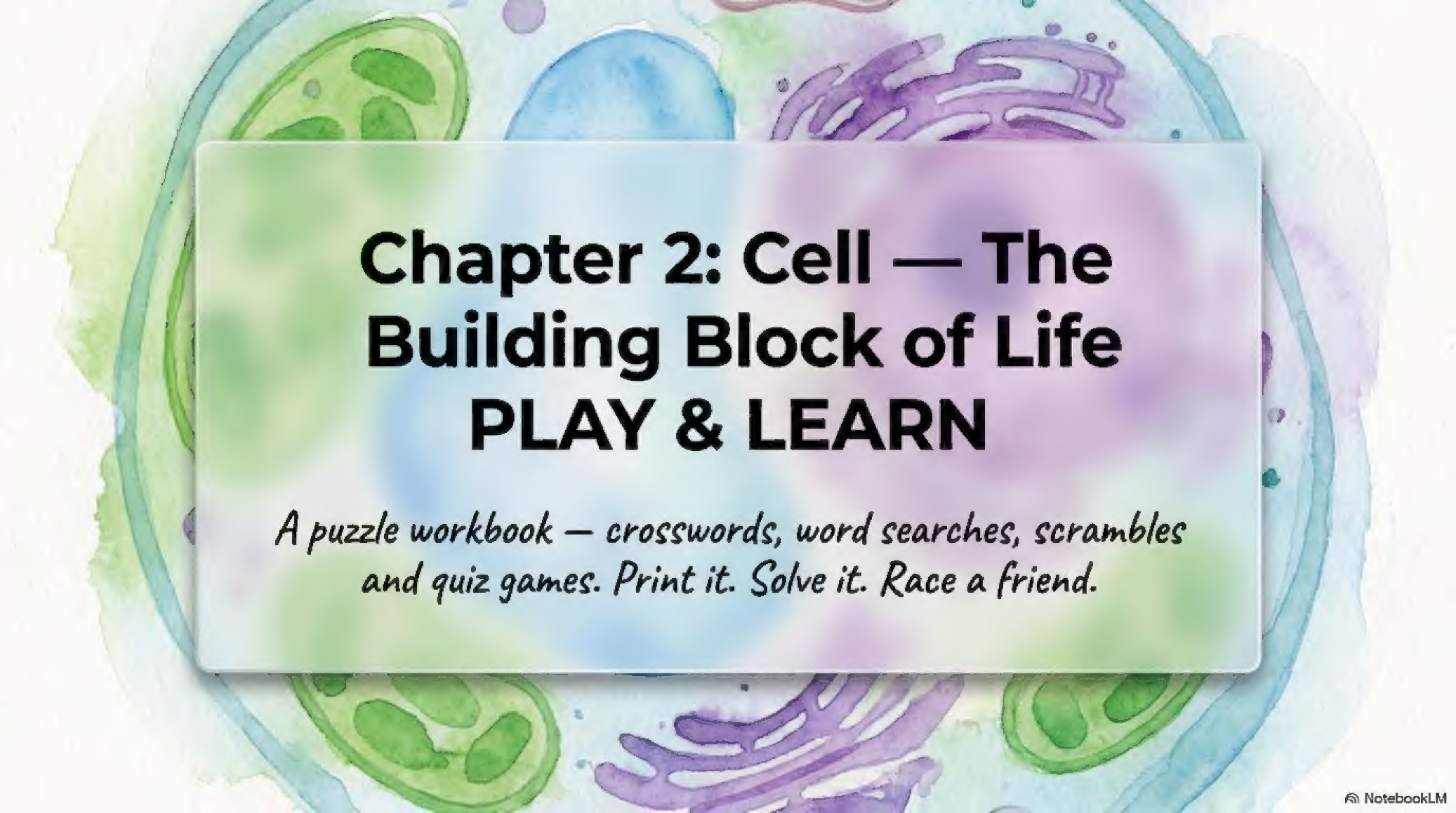
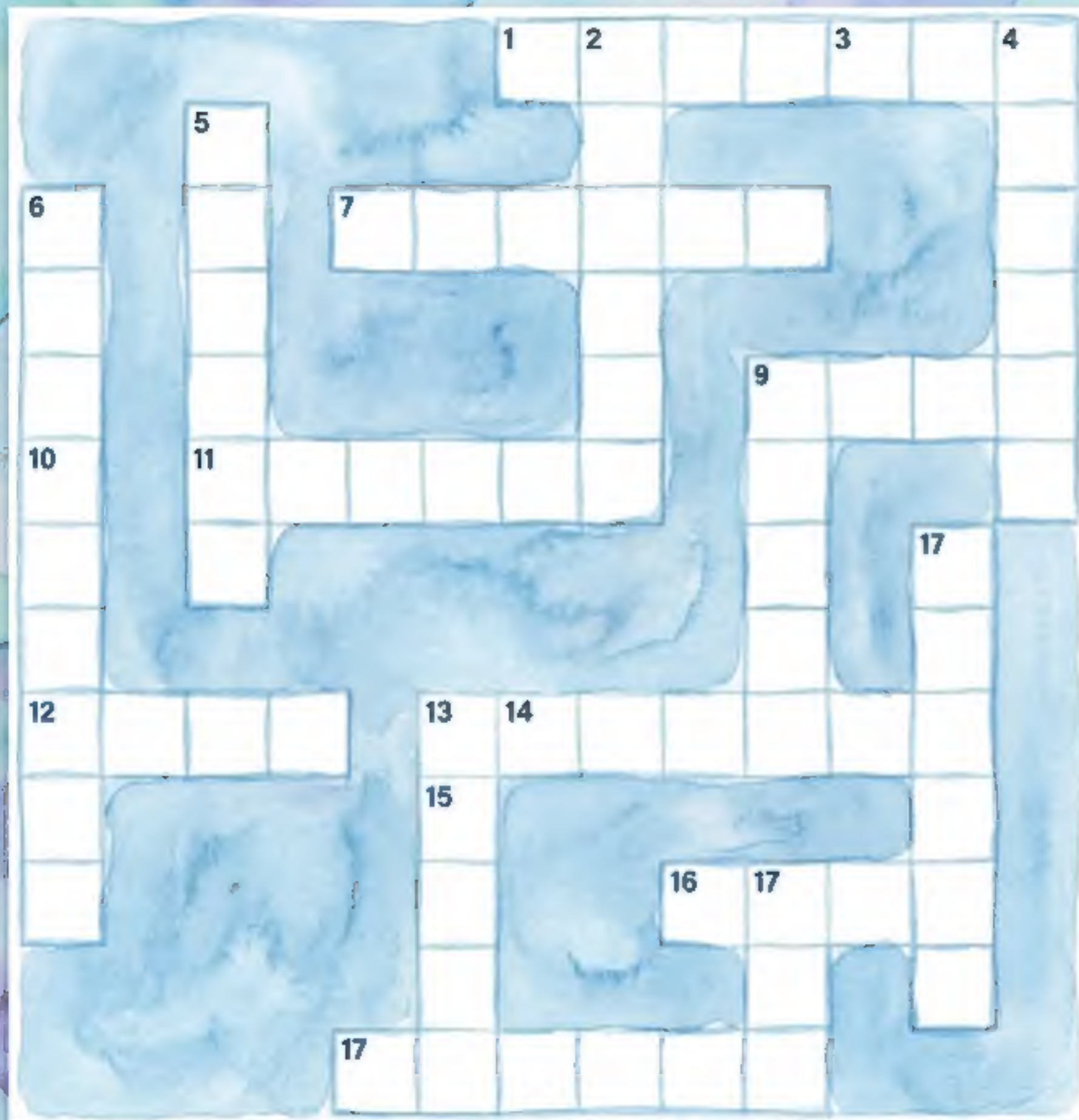




Chapter 2: Cell — The Building Block of Life PLAY & LEARN

*A puzzle workbook — crosswords, word searches, scrambles
and quiz games. Print it. Solve it. Race a friend.*



Puzzle 1 - The Organelle Crossword

Every answer is a word from Chapter 2.

Fill the white squares — one letter per square.

ACROSS

3. The basic unit of all life (4)
5. Tangled thread form of DNA in a resting cell (9)
7. The powerhouse of the cell (12)
9. He first saw and named cells, in 1665 (5)
10. What a plant cell wall is mainly made of (9)
11. Division that makes four cells, chromosomes halved (7)
14. Movement of water across a selective membrane (7)
16. The cell's clean-up and recycling sac (8)
17. The control room holding the DNA (7)

DOWN

1. Tiny structure where proteins are made (8)
2. A shape whose part looks like the whole (7)
3. Folds of the inner mitochondrial membrane (7)
4. Movement from high to low concentration (9)
5. The jelly-like substance filling the cell (9)
6. Apparatus that packs and dispatches (5)
8. Green plastid where photosynthesis happens (11)
12. Storage sac that keeps a plant cell firm (7)
13. Division that makes two identical cells (7)
15. A functional segment of DNA (4)

Bonus Words that did not fit the grid — define in a sentence:

ATP

C	E	L	L	W	A	L	L	D	T	U	R	G	O	R
P	Y	T	F	R	A	C	T	A	L	V	P	I	A	L
J	E	V	O	S	M	O	S	I	S	T	G	Q	F	Y
E	K	V	O	S	U	E	L	C	U	N	D	N	A	P
M	H	K	M	V	I	G	U	S	I	S	O	T	I	M
O	N	Z	Z	Y	G	G	S	I	S	O	I	E	M	M
S	P	L	A	S	T	I	D	H	S	K	G	E	E	P
O	L	B	E	M	O	S	O	B	I	R	I	W	C	I
S	F	D	O	E	N	Z	Y	M	E	P	G	I	G	N
Y	M	U	K	Q	S	T	R	O	M	A	L	P	V	K
L	W	O	E	N	E	G	T	O	K	C	O	B	I	T
B	O	V	W	C	R	I	S	T	A	E	G	I	S	L
H	J	U	Z	S	A	U	E	M	O	G	A	Y	I	H
Y	E	Z	B	U	D	O	D	U	R	U	U	Z	L	C
V	G	G	P	I	F	W	E	L	O	U	C	A	V	A

Puzzle 2 · Cell Safari Word Search

18 terms are hiding in the grid – across, down, diagonally, and backwards. Circle each one, then tick it off the list. Beat 10 minutes and you have earned your microscope.

WORD BANK

- | | | |
|-----------------------------------|----------------------------------|--------------------------------|
| ☐ RIBOSOME | ☐ MITOSIS | ☐ GOLGI |
| ☐ LYSOSOME | ☐ MEIOSIS | ☐ HOOKE |
| ☐ CELLWALL | ☐ FRACTAL | ☐ GENE |
| ☐ NUCLEUS | ☐ STROMA | ☐ DNA |
| ☐ VACUOLE | ☐ ENZYME | |
| ☐ CRISTAE | | |
| ☐ PLASTID | | |
| ☐ OSMOSIS | | |
| ☐ MITOSIS | | |
| ☐ MEIOSIS | | |
| ☐ GENE | | |
| ☐ DNA | | |

Race Rules

Solo: find all 18. Note your time at the top.

Pairs: one partner finds across-and-down words, the other finds diagonals. First pair to complete the list wins.

Hard mode: cover the word list. Find as many biology terms as you can in 5 minutes.

Champion move: for every word you find, say its function out loud. No function, no point.

Puzzle 3 · Scrambled Organelles

Unscramble the letters. The clue in brackets is your lifeline — try to solve without it first.

1.	R S C H O M O E M O	(rod-shaped, visible just before division)	_____
2.	T E Y O P K R R A O	(a cell with no true nucleus)	_____
3.	E M M A B R N E	(the selectively permeable boundary)	_____
4.	R R U G T O	(the pressure that keeps a plant firm)	_____
5.	R S I N A N F A	(the red stain used on onion peel)	_____
6.	A M A B O E	(moves by flowing, has no cell wall)	_____
7.	E I T M R P L O H H E	(heat-loving bacterium of Puga Valley)	_____
8.	K O C L E T E Y S T O N	(the fine fibre network inside a cell)	_____
9.	O I T E N C T O P T Y	(one plant cell can regrow a whole plant)	_____
10.	B O Y S D I O M I E N S	(how mitochondria may have joined the cell)	_____



Make It a Game

Beat the Bell: Set a 60-second timer. Every unscrambled word = 1 point; add a definition = 3 points.

Chain Scramble: In a circle, scramble a Chapter 2 word for the person on your left. Miss it and you are out.

Puzzle 4 · Odd One Out

Three belong together. One does not. Circle the odd one — then write why in one line. The why is where the marks are.

Nucleus

Mitochondrion

Cell wall

Golgi apparatus

Because...

Chlorophyll

Chromoplast

Leucoplast

Ribosome

Because...

Hooke

Schleiden

Schwann

Newton

Because...

Osmosis

Diffusion

Photosynthesis

Concentration
gradient

Because...

Bacteria

Yeast

Virus

Amoeba

Because...

Cristae

Villi

Alveoli

Cell sap

Because...

Mitosis

Meiosis

Gametes

Chromosome
halving

Because...

Onion peel

Cheek cell

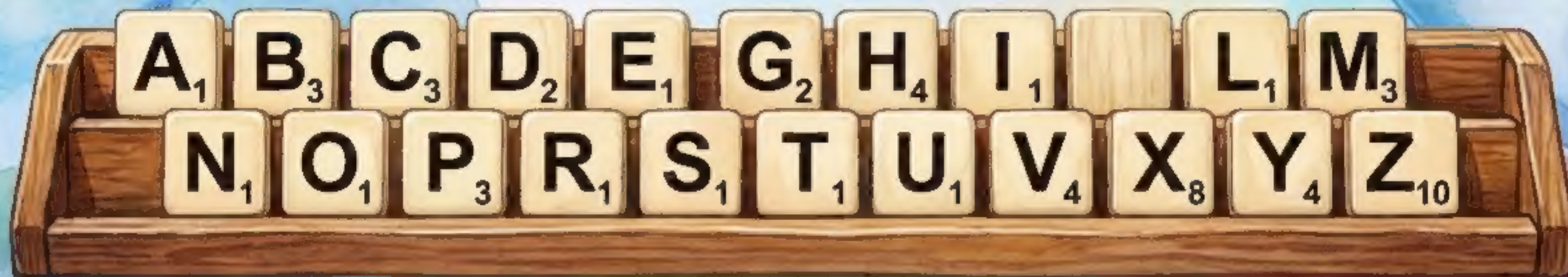
Spinach leaf

Potato cell

Because...

Puzzle 5 · Cell Scrabble

Play in groups of 3–4. You have one shared rack of letter tiles. Build only biology terms from Chapter 2 — no ordinary English words allowed.



Scoring Rules

Each letter tile used	= Its tile value	You can state its function correctly	= + 5
Word is a Chapter 2 term	= $\times 2$	You can name where in the cell it sits	= + 3
Word is 8 letters or longer	= + 10 bonus	Word is not in Chapter 2 (challenged and lost)	= - 5

How a Round Works

- Player builds a **word** from the rack and lays it down.
- Opponents may **challenge** within **10 seconds**: That's not in Chapter 2. Check the textbook. Wrong party loses 5 points.
- Builder states the **function** to claim the +5 bonus. The group votes. **Play 6 rounds.**

Puzzle 6 · Who Am I?

One student reads only the first clue aloud; the class guesses. Wrong guess? Read clue 2. Fewer clues used = more points.

1. Folded over and over.
2. Makes the cell's energy.
3. The powerhouse.

1. I am green.
2. I trap sunlight.
3. Without me, no photosynthesis.

1. A sac full of enzymes.
2. Break down the broken.
3. Cell's recycling van.

1. Biggest thing in a plant cell.
2. Full of watery sap.
3. When I empty, the plant wilts.

1. Not a cell at all.
2. Genetic material in a protein coat.
3. Must invade to multiply.

1. Rigid, only plants/fungi/bacteria have me.
2. Made of cellulose.
3. Stop cell from bursting.

1. Hold the instructions.
2. Pores in my double coat.
3. The control room.

1. Tiny, come in two subunits.
2. Free or stuck to the ER.
3. Build proteins.

1. Stack like flattened pouches.
2. Wrap and label.
3. Cell's post office.

1. Looked at cork in
2. Thought of monks' rooms.
3. Named the cell.

1. Water on the move.
2. Need a selectively permeable membrane.
3. Salt on kairi proves I exist.

1. Make two, not four.
2. Daughters are identical.
3. Heal your cuts.

1. Make four, not two.
2. Halve the chromosome number.
3. Without me, no variation.

1. Look like a tangled thread.
2. Condense before division.
3. Become a chromosome.

1. Said all plants are made of cells.
2. Year 1838.
3. Partner did animals a year later.

1. No nucleus, live in your curd.
2. Double every 20 minutes.
3. I am Lactobacillus.

1. Proved cells come only from cells.
2. Year 1855.
3. Completed the Cell Theory.

1. Part of me, magnified, looks like all of me.
2. Trees, coastlines, lungs wear my pattern.
3. I am a fractal.

1. 70 square metres folded into your chest.
2. Do gas exchange.
3. I am the alveoli.

1. Lost nucleus to carry oxygen.
2. Live about 120 days.
3. Red blood cell.

Scoring: After clue 1 = 5 pts · after 2 = 3 pts · after 3 = 1 pt.

Puzzle 7 • True or False Sprint

Everyone stands. Teacher reads a statement. True → stay standing. False → sit down. Wrong? You are out.

- | | | |
|---|----------------------------|----------------------------|
| 1. All cells have a nucleus. | ☐ T | ☐ F |
| 2. The cell wall is made of cellulose. | ☐ T | ☐ F |
| 3. Osmosis needs a selectively permeable membrane. | ☐ T | ☐ F |
| 4. Viruses are the smallest living cells. | ☐ T | ☐ F |
| 5. Mitochondria have their own DNA. | ☐ T | ☐ F |
| 6. Animal cells have a large central vacuole. | ☐ T | ☐ F |
| 7. Meiosis produces four daughter cells. | ☐ T | ☐ F |
| 8. Robert Hooke saw living cells under his microscope. | ☐ T | ☐ F |
| 9. Cristae increase the surface area for making ATP. | ☐ T | ☐ F |
| 10. A potato in salt water gains weight. | ☐ T | ☐ F |
| 11. Cancer cells ignore contact inhibition. | ☐ T | ☐ F |
| 12. Chloroplasts are found in every plant cell. | ☐ T | ☐ F |
| 13. A fractal looks the same at different magnifications. | ☐ T | ☐ F |
| 14. The lysosome builds proteins. | ☐ T | ☐ F |
| 15. Bacteria are prokaryotic. | ☐ T | ☐ F |
| 16. Programmed cell death is always harmful. | ☐ T | ☐ F |

Puzzle 8 • Cell Bingo (Word Bank)

Pick 16 words. Draw your grid. Wait for the caller.

Nucleus Mitochondria Ribosome Lysosome

Golgi apparatus Vacuole Chloroplast

Cell wall Cell membrane Cytoplasm

Chromosome Gene Osmosis Diffusion Mitosis

Meiosis Cristae Chromatin Prokaryote

Eukaryote Cellulose ATP Nucleolus Plastid

Puzzle 9 • Two Truths and a Lie

Two are true, one is a lie. Identify the lie and correct it on the line.

Set 1

- (a) Mitochondria have their own DNA.
- (b) Chloroplasts are found in all plant cells.
- (c) Both mitochondria and chloroplasts have double membranes.

The lie is _____. Corrected: _____

Set 2

- (a) A cheek cell has no cell wall.
- (b) An onion cell shrinks completely in sugar solution.
- (c) Cheek cells are used in DNA testing kits.

The lie is _____. Corrected: _____

Set 3

- (a) Prokaryotes are 1–10 μm across.
- (b) Prokaryotes have membrane-bound organelles.
- (c) Bacteria are prokaryotes.

The lie is _____. Corrected: _____

Set 4

- (a) The alveoli of your lungs total about 70 m^2 .
- (b) Folding increases surface area without increasing volume much.
- (c) A smooth membrane would give the same surface area as cristae.

The lie is _____. Corrected: _____

Set 5

- (a) Meiosis happens in all body cells.
- (b) Meiosis produces gametes.
- (c) Meiosis creates genetic variation.

The lie is _____. Corrected: _____

Set 6

- (a) Robert Hooke named the cell in 1665.
- (b) Virchow showed cells arise from pre-existing cells.
- (c) Schleiden proved all animals are made of cells.

The lie is _____. Corrected: _____

Puzzle 10 · Escape the Cell

You have been shrunk and injected into a plant cell.
Solve all five gates to unlock the exit code.



GATE 1 — The Membrane
How many nanometres thick is a cell membrane, at the lower end of the range? That number is your first digit. []



GATE 2 — The Powerhouse
Count the letters in the folds of the inner mitochondrial membrane (the word itself). That count minus 0 your second digit. []



GATE 3 — The Nucleus
A mature red blood cell survives about 120 days. Take the first digit of that number. That is your third digit. []



GATE 4 — The Wall
In which year did Robert Hooke name the cell? Add the last two digits together ($6 + 5$). That is your fourth digit. []



GATE 5 — The Fractal Gate
How many times do the bronchioles of a human lung branch? Take the first digit. That is your fifth digit. []

EXIT CODE:

Teacher's Note: Hide the five gate cards around the classroom. Teams rotate every 4 minutes. First team to reach the door escapes. Losing teams get reabsorbed by a lysosome.